Idaho National Engineering and Environmental Laboratory

Nontoxicological Chemical Hazards: Their Importance and Methods for Their Evaluation

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Facility Chemical Hazard Evaluations

- *Required for numerous reasons*
  - *Facility authorization basis*
    - *What level of review and approval needed*
    - *Facility hazard level classification*
  - *Emergency response issues*
    - *Event potential*
    - *Source terms*

Common Methods of Analysis

- *Measure facility chemical inventories against RQs*
  - *Yes/No answer*
- *Use modeling to determine chemical airborne concentrations at a given distance*
  - *Compare against ERPG, STEELS of other measures to determine level of hazard*
- *Valuable tools*

Weaknesses In These Approaches

- *Rely upon toxicological endpoints*
- *Information available for limited number of chemicals*
  - *< 2,000 chemicals*
- *Does not factor in other chemicals present*

Issues Not Covered

- *Estimated 50,000 chemicals used in industry*
- *Chemicals have hazards other that toxicity*
- *Environment of chemical*
- *Mixtures*
- *Chemical form*
- *Multiple chemicals*
- *Thinking issues*

Alternate/Additional Methodology

- *Continue to use traditional approach*
- *Add new approach*
  - *Evaluate and limit chemical hazards*
    - *Flammability, oxidizer, reactive, etc.*
    - *Hazard levels*
  - *Quantities allowed based upon hazards levels*

How Can This Be Done?

- *Uniform Building Code good starting point*
  - *Require by DOE Order*
  - *UBC defines chemicals and hazard levels*
  - *Other hazards can be added as necessary*
- *Classify all chemicals*
  - *Document decisions*
- *Determine limit levels and how those limits will be used*

Advantages

- *Able to quantify all chemical hazards*
- *All chemicals and mixtures covered*
- *Chemical form factored in*
- *Allows multiple chemicals at one location can be evaluated*

Disadvantages

- *Need to evaluate and understand hazards of all chemicals present*